Rough volatility

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The scaling properties of historical volatility time series, which now appear to be universal, together with the scaling properties of implied volatility smiles, motivate a new class of stochastic volatility models where paths of volatility are rougher than those of Brownian motion. Rough volatility connects the microstructure of financial markets with the large-scale behavior of volatility as encoded in the implied volatility surface. Rough volatility models are remarkably consistent with both econometric data and option prices and yet are typically very parsimonious. This mini-course will present an overview of rough volatility and its applications, including efficient forecasting of future integrated variance and option pricing.